SEMICONDUCTOR LASER DEVICE

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Abstract

PROBLEM TO BE SOLVED: To provide a low-voltage indigo laser having low electrical contact resistance, which includes a contact layer of a nitride material having an increased concentration of p-type carriers. SOLUTION: Layers 2 and 3 are grown on a sapphire substrate 1 by metal organic vapor phase epitaxy. Lithography and etching are carried out to form an insulating mask for selective growth, and layers 4-8 are selectively grown. Another insulating mask is formed and the layer 8 is selectively grown into a periodic regular pyramid with a hexagonal base. The resulting structure is furnished with p- and n-electrodes by deposition and cleaved in a direction perpendicular to the waveguide stripes. Since the contact resistance between the p-contact layer and the p-electrode is decreased, operating voltage can be decreased to 3.2-3.4V compared with 3.6V for convention devices, when injection current is 20mA.